

VALUE CHAINS AND GOODS FLOW MANAGEMENT IN BRAZIL: REFLECTIONS ON TERRITORIAL LOGISTICS

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Abstract *Global value-chains operate on the basis of the territorial logistics of companies specialized in the management of flows of merchandise, determining complex topologies. These organizations form spatial production circuits and circles of cooperation in space. In this study we analyze this problem on the basis of the Multimodal Transport Operators (MTO) registered with the National Land Transport Agency (NLTA) (Agência Nacional de Transportes Terrestres - ANTT). It is possible by means of this survey to understand the corporate strategies for the circulation of merchandise.*

Key words *logistics; circulation; value-chain; spatial production circuits; circles of cooperation in space.*

Introduction

Globalization and competitiveness are based on the process, much intensified, of the economic “horizontalization” of spaces, bringing together research and development (R&D), production and commerce. This became possible, in its turn, by means of the creation of global value chains, a global spatiality of firms in terms of competitive advantage, in the quest for the reduction of the costs of circulation and production.

The enlargement of global markets, a consequence of the development of capitalist forms of production and of the other transformations occurring at all levels of geographical space, makes the reproduction of surplus value on the global scale an even greater challenge for large companies.

Various interests are involved in international relations in such a way that the flows are not totally free. However, the need for the removal of obstacles, whether physical or otherwise, creates specific forms of circulation, as is the case with the forms of

circulation that have emerged at the present time, in the logistics-telematics period.

The paradigm of the circulation which we call logistics-telematics is related to the period of globalization (as from the decade of the 1970s), based on capillary circulation, competitiveness, and the formation of productive chains of great complexity.

The interdependence between logistics and information technologies is one of the characteristics of the corporative movement of merchandise. It has been possible thus to synchronize and create a rigid time control over the material flows, adding speed in circulation without introducing systematic changes in the existing means of transport. Thus logistics has become one of the basic factors in value chains, an activity capable of adding still greater value as regards the transport itself.

Among the changes in the process of circulation of merchandise is the creation of global value chains as a result of the strategies of large

companies which seek increasingly to aggregate value during the process of circulation (a part of the wider process of production). It is in this sense that we understand that the notions of spatial circuit of production and circles of spatial cooperation (Santos 1991; Santos 2004; Santos and Silveira 2006; Castillo and Frederico 2010), understood independently of the value chain, do not contemplate value as a fundamental element of the economic dimension of space.

The strategies of corporations are based on territorial logistics (Silva Junior 2001; Silva Junior 2009), i.e., the territory is used as a resource for the corporative agents whose actions take place by common consent with the State. Territorial logistics, therefore, gives concrete expression to this relationship and to the companies' knowledge of the territory, with all their norms, limits, etc. All strategic logistics occurs within the territory, but not all the elaboration of strategic logistics takes place on the basis of the territory. It is in this sense that we analyze specifically the concrete application of the companies' actions.

In order to understand territorial logistics we must consider its central aspect, i.e., the "territorial logic of the companies", in view of the fact that, according to Santos and Silveira (2006, p. 292-3), "each company, each branch of production, produces, parallel to it, a territorial logic", creating specific topologies in accordance with the strategy of each company, in such a way that, "for each one of them, the territory of its immediate interest is composed of that set of points essential to the exercise of its activity, in its most important aspects"¹.

In the light of the foregoing, we propose to present a geographical analysis of value-chains, based on Multimodal Transport Operators in Brazil (MTO) and their insertion into the spatial circuits of production and circles of spatial cooperation. We denominate the companies registered as MTO managers of the flow of goods (MFG). For this purpose we have used information obtained from logistics operators, port operators, dry dock operators and foreign trade agents who are registered as MTO on the basis of the data provided by the Agência Nacional de Transportes Terrestres (ANTT) (National Land Transport Agency – NLTA).

Some transformations in corporative circulation, the creation of value chains, and the logistics-telematics paradigm

Barat (2007, p. 17-8) indicates briefly some important changes which have occurred since the 1980s and 1990s, which, in their turn, have led to the creation of a larger organization and greater rationality on the part of the corporations in their transport of merchandise, including: strategic scenario planning, competitive advantage (Porter & Millar 1998), strategic alliances, outsourcing, and core competence as well as just in time.

These alterations have had their impact on the processes of production and the logistics of the outflow of products on the basis of technological changes which occurred first in the United States (secondarily in Japan) and were afterwards disseminated throughout the world. We may further quote the political transformations arising from British and North-American neoliberal reforms (as from 1979-80), which spread throughout Latin America in the 1990s, and the collapse of the Soviet Block in the late 1980s. In the meantime normative restructuring occurred on the basis of new forms of the regulation of international trade whose milestone was the Uruguay Round of GATT (General Agreement on Tariffs and Trade) and the later creation of the World Trade Organization (WTO) in 1994.

The organization and build-up of technical networks, together with the opening up of processes of deregulation and the liberalization of markets (institutional norms), favored the rise of public networks managed by private enterprises. This is what is meant by internalization. The multinational companies became more complex as a result of the technological possibilities and outsourcing. This movement expanded with globalization, emerging in the form of new business opportunities and also as a way of reducing production costs. Thus logistics is one of the main expressions of corporative circulation. It has become a quest in the face of the growth of the competitiveness of capitalism and the multi-localization of specialized production. In its turn, competitiveness "imposes" the need for the reduction of the companies' global production costs and an increase in the speed of the process of the circulation of capital. Therefore, if capitalism is, in the first place, a fragmentation process which occurs in the political, social and economic

¹ Freely translated from Portuguese.

dimensions on a planetary scale, the global extent (globality) of production demanded, as from the 1970s, new strategies of circulation. The reduction of costs and the increase in the speed of its flows undertaken in productive chains became the central elements of this process.

Infrastructures were reorganized to meet the new demands of fluidity, including the new forms of production and logistics, in such a way that the ports and airports came to be organized to meet new technical and normative functions, becoming, among other things, areas of customs clearance and industrial and logistics centers. Distribution centers increased their size progressively so as better to undertake the administration of storage and stocks, becoming more “verticalized”.

The period of the logistics-telematics paradigm has also been marked by the progressive fusion of the storage/distribution infrastructures and the systems of movement and the use of extremely sophisticated technologies and systems, based on information technologies and robotics and on the strategies of the logisticians (academic and professional consultants and managers in the field of logistics). The logisticians are responsible for the storage and the separation of merchandise, serving both for the inputs and for the outputs of the companies, being widely utilized by logistics operators.

Logistic equipping is one of the instruments for the practical application of the measurement of scheduling and the synchronization of transportation in the quest for the permanent increase of the speed in the warehouses or distribution centers. The measurement of scheduling and synchronization is of strategic value as it reveals a more efficient level of services. Thus logistics also involves the synchronization of the flow of merchandise and information. Flows come to be reassessed in terms of competitive time and thus assume an even greater technical density, leading to the reduction of the costs related to the various stages of the value-chains.

Value-chains: importance for the understanding of corporate circulation in space

Globalization is systematically based on the growing economic horizontalization of spaces across national frontiers, integrating agents and

processes of research, development, production and commercialization in their multiple and complex dimensions, thanks to the means and methods which enable them to circulate rapidly over great distances.

Macro-markets are organized around macro-axes of production, creating spatial circuits of production and circles of cooperation in space, the result of the articulation between infrastructures, systems of circulation, the strategies of States and the rational choices of the companies concerned. The territorial logistics practiced by the corporations to achieve the integration of the markets calls for greater normative and rational techno-scientific density. This is an expression of the “scientification” of technique (Habermas 2006).

Dreifuss (2001, p. 184) explains this understanding by referring to the intertwining of transnational production in Japan, South Korea, Hong Kong and Taiwan. As regards the assembly of products, the author states that the companies of the circuit constitute a “sequence”, that is to say, “across the various national territories”.

In order to deal with the questions presented in the foregoing item, Michael Porter drew attention to the discussion of value-chains, when he recognized the spatiality of the companies in terms of competitive advantage, on the basis of the understanding of costs (particularly their reduction) as an essential tool of competitiveness. In his essential formulations, Porter included *information* as a competitive advantage of strategic significance and a basis for the productive chains managed by the large companies. Porter & Millar (1998, pp. 83-106) based the importance of information as competitive advantage on the fact that the value-chain highlights the role of Information and Communication Technologies (ICT).

In accordance with Porter and Millar (1998), the concept of the value-chain relates to the various activities (stages of production and circulation); “this concept [value chain] divides a company’s activities into the technologically and economically distinct activities it performs to do business. We call these ‘value activities’” (p. 77), which, in their turn, fall into nine “generic” categories which encompass everything from the physical production (primary activities) to services. Among the nine categories are the input and the output logistics.

The value-chain is not only the corporative version of the understanding of the spatial pro-

duction circuit and the circle of cooperation - what differentiates it is its analysis from the point of view of costs, whereby the sum of the costs of the links in the chain must be less than the total value generated (production-circulation-exchange-consumption). This reveals the importance of strategy and of competitive advantages which, though they generate costs, become basic elements in corporate competitiveness. It is the concept of the market differentiation which generates surplus value at the present time. It is for this reason that logistics as such and not just the transport of goods in itself is to be considered competitive advantage, as one is dealing with a differentiating activity in terms of the movement of merchandise. The concept of the value-chain also includes the circulation of information, seen also as a competitive advantage.

On the other hand, the notions of spatial circuit of production and circles of cooperation, created to understand the circulation in space of a certain product from a particular region, do not contemplate value as an economic factor. The productive spatial circuits and the circuits of cooperation together compose a form of circulation in which there occurs a confluence of the flows of tangible goods and the instances supposedly spatially separated (production - circulation - distribution - exchange - consumption). The flows of information determine the exchanges, the orders, the finances and the production, even before there is any actual physical, spatial interchange (or material circulation), guaranteeing the articulation of the various spaces necessary for competitiveness on its different levels of scale, within a context of the increasing territorial division of labor. Therefore, the notions of the productive spatial circuit and of circles of cooperation in space are more closely related to territorial dynamics than to the dynamic of the companies themselves (which also have their own territorial policy) and their competitive strategies, which extend from the local to the global scale.

Multimodality as a corporate strategy

There is a series of organizational links of solidarity between industry and suppliers of services which arise from a growing "interpenetration" between the spaces of production, exchange and consumption. For Veltz (2005), this interpenetration is a consequence of an economy of speed (hypermobility), which makes possible the

interweaving of complex chains of the creation and "capture" of value, constructing a transverse structure involving "market space" and "production space". In this process, coordination (the organization and standardization of procedures) is the ability to articulate the various activities integrated into the great company. The changes in the processes of coordination result from the market imperfections that promote new strategic advantages, new competitive advantages and new ways of internalizing the costs of transactions. In view of the generality of the proposition, Veltz (2005, pp. 145-8) lists seven factors which characterize the movement towards globalization: control of the value-chain and the outsourcing of non-strategic activities, decentralized market-oriented model, centralized administration of commercial data and technical knowledge, globalization of purchases, operational coordination of units of the firm and logistics, integrated conception of products, and internal and external benchmarking. By virtue of these factors, what we may call multimodality has been created as a result of the need for the corporate agents to make their merchandise circulate in a coordinated way.

For this purpose, new "verticalities" emerge to meet the needs of cooperation between the various sectors which compose the productive chains. These relationships contain great informational density, outlining their technical and normative role. Despite this, and the great importance of the norms for the understanding of the circulation, the greater part of the research undertaken in Brazil into the movement of goods is dedicated to technical aspects and rarely takes into consideration the institutional and normative aspects of the circulation. The norms, then, which in general appear as footnotes to the analyses of the circulation of goods, are in fact - together with the techniques - central elements in the circulation.

Multimodality is the movement of merchandise under the responsibility of a single company which uses two or more modalities (freight systems) to transport the products of one shipper (the one who contracts the service) from their origin to their destination, under the terms of just one contract (called Bill of Lading). The company responsible for this kind of operation is the MTO.

The multimodal cargo transport arose from the need to offer greater agility and efficiency in the movement of goods along the value-chains, as

well as to provide greater security for the company which contracted the service. Some countries have had legislation relating to this logistic modality since the approval of the proposal of the Convention of the United Nations Conference on Trade and Development (UNCTAD), better known as the Geneva Convention on International Multimodal Transport of Goods, in 1980. Therefore, multimodal transport arises on the basis of an institution, thus reinforcing its normative character.

The MTO is a consequence of advances in logistics, which uses the roughness of the territory in its favor, seeking to surmount territorial barriers by means of techniques and norms. At the beginning of the process of the internationalization of services, which occurred in the 1960s and 1970s, logistics arose as internationalized business, in view of corporative need and in the face of growing competitiveness.

The corporative development of logistics by means of technical and operational knowledge met with restrictions in the territory, such as: agglomeration diseconomies, relatively low port capacity, insufficient railroads for freight etc., so that companies started to come together in national and international logistic associations to overcome these bottlenecks by "strategic planning". Based on these interests, norms were drawn up for the development of logistics as such (not only for the transport of goods).

The process of the normatization of multimodal transport was launched in Brazil in 1994, by means of an agreement with Argentina, Uruguay and Paraguay, within the context of the creation of the Southern Common Market (Mercado Comum do Sul – Mercosul). The agreement between the plenipotentiaries sought "a more efficient use of the transport infrastructure of the signatory countries, contributing to the reduction of the operational costs of transport in the region" (Brasil 1995). The definition of Multimodal Cargo Transport was also the object of reflection, being practically the same as that previously presented in Law n° 9,611 (Brasil 1998). According to Article 2 of that law, "Multimodal Cargo Transport is that which, within the terms of a single contract, makes use of two or more transport modalities, from its origin to its destination, and is under the exclusive responsibility of one Multimodal Transport Operator".

Ten years later, in 2004, the MTOs were created in Brazil by the National Land Transport

Agency's (Agência Nacional dos Transportes Terrestres – ANTT) resolution n° 794/04. According to Article 1 of that resolution, "The exercise of the activity of the Multimodal Transport Operator – MTO, with which Law n° 9611, of February 19, 1998 and Decree n° 1563, of July 19, 1995 deals, depends on the Operator's prior certification and registration with the National Land Transport Agency (NLTA)".

From the technical point of view, the MTOs are companies qualified to undertake the corporative transport of goods, many of them being logistics operators, acting in the territory with the high technical competence necessary to deal with the complexity of the act of transporting large volumes of goods, the handling of which must be exercised with care and in some cases with "surgical" precision.

Multimodality is derived from intermodality, a previous formulation of logistics characterized by the movement of goods by means of more than one transport modality, an individual document being issued for each modality used on the basis of a sharing of responsibility between the companies involved (whether they be transport companies or logistics operators). This was one of the reasons for the creation of multimodality, i.e., the responsibility and the agility which this instrument would bring to the process of circulation of merchandise in the territory. In fact, multimodality is an institutionally normative concept whereas intermodality is a technically normative concept. All multimodality is intermodal, but not all intermodality is multimodal. Intermodality first became viable by virtue of techniques and not by virtue of norms, differently from multimodality which was created on the basis of norms and control. As multimodality is a means of institutional regulation, we affirm that the norms are also established to regulate the movement of merchandise in the territory. In the following item we shall be presenting some elements to aid the understanding of how the MTOs establish their territorial logistics, consonant with value chains, spatial circuits and circles of cooperation.

One can only reflect on territorial logistics within the context of the relationship between the State and the companies which manage the flows of goods; these companies create flows and transform them into strategic components (Silva Junior 2009). Territorial logistics is then an action within a given territory, based on corporative agents which

possess intelligence on the territory, using public and private infrastructure, as well as all the other components of circulation, both technical and normative. Within this context, the norms are the factor which, basically, controls the flows. Territorial logistics fits in a highly complicated fashion into a wide range of apparently static relations, which are, however, dynamic when understood in their totality, within the model production – distribution – exchange – consumption.

MTOs, topologies and territorial logistics

In order to be able to provide a better basis for our analysis of value-chains we undertook a survey on the site of the NLTA. There were, between January and June, 2009, 337 companies registered as MTOs, but we also proceeded to confirm their existence, by following four steps: 1) the elaboration of a spread-sheet and a databank for analysis and georeferencing; 2) an inquiry regarding the companies' sites; 3) those companies which did not give sufficient information or whose sites could not be located were then contacted by telephone. Those companies whose sites contained all the required information were contacted to confirm that it was up-to-date; 4) the research project was finally based on 113 MTOs.

The remaining 186 registered companies refused to give any information or did not reply to the questionnaire sent by email when it was requested of those interviewed by telephone. Some of the companies in this group no longer declare themselves to be MTOs, either because of problems related to taxation and insurance, or because they were unfamiliar with the relevant regulation. Other companies had closed or could not be contacted (without site, email or telephone). There are also companies which had registered as MTOs, which do not, however, actually render services whether logistic or of transport.

In the light of the sample, we will now pose some operational questions about the MTO. The questions we will discuss do not represent those of the corporative agents, nor reflect any contamination by the literature or the acritical thinking of the logisticians, but are rather statements regarding the viability of this instrument for corporative circulation.

The MTOs maintain their head offices preferentially in State capitals, cities of metropolitan

regions and port cities. It may be affirmed that on the national scale there is nothing new in this as regards the localization of companies, in relation to the other branches of the economy. We also consider it redundant to say that these companies are to be found in the region of greatest urban concentration within Brazilian territory, known as Concentrated Region (Santos & Silveira, 2006).

However, on the urban (city) scale, in view of the large size of the buildings of the logistic operators (like those of large factories) and their need to ensure an efficient flow of goods, there is an attempt to minimize urban bottlenecks by means of localization on great avenues, by preference the freeways and those that are link-roads or which are situated close to highways. In the São Paulo Metropolitan Region, for example, the logistic operators are located principally on the Tietê and Pinheiros inner-ring roads and on the main highways such as the Castello Branco, Dutra, Anhanguera, Mário Covas Ring Road, Anchieta, Bandeirantes, Imigrantes and Régis Bittencourt. Throughout the years dedicated to this research, the large numbers of logistic operators located in Alphaville and Tamboré called our attention. The companies are sited at these points for two basic reasons: ease of access and the availability of areas suitably large for the Distribution Centers (DC).

The territorial policy of the *managers of the flow of goods* (MFG) is not restricted to head offices and branches. By means of various operational agreements with associated companies, within the perspective of the establishment of circles of spatial cooperation, the companies make use of infrastructure facilities (offices, highway coach ticket offices, airport ticket offices, distribution centers, warehouses etc.) for the undertaking of their territorial logistics, and their specific topologies, creating networks and dense, complex circuits of flows of goods and information. Not all the companies use outsourced infrastructure facilities and some practice total outsourcing.

If we take as reference the terminals alone, that is to say, distribution centers, hubs, logistic platforms, warehouses and every kind of infrastructure created to concentrate and distribute merchandise throughout the territory, one then has an even more significant spatiality as regards the strategic role of territory and places which by means of the flows cover the whole country.

These topologies are spatially conceived by the

companies that administer the flows, in accordance with their principal logistic activity, creating strategies of siting determined by costs, speed and client portfolio. We classify the companies which administer flows of merchandise on the basis of their topologies, enumerated by order of occurrence: 1) Logistic operator, 2) Cargo transport (highway, railroad, aerial, maritime, fluvial, express, intermodal), 3) Port operator, 4) Dry dock operator, 5) Operators with no tangible assets (transport agencies, foreign trade agencies, Customs' and other middle-men).

If we take as our starting point the technical and normative densities of the companies which administer the flows of merchandise, the logistic operator model applies to all the other examples. There exist technico-normative actions which constitute the presuppositions of the activity of the multimodal transport operation. We consider that the essential elements common to all the logistic flows are:

- Know how – developed on the basis of knowledge of the activity undertaken and of studies and projects. The territory is a central element for the development of strategies and the obtaining of this knowledge;
- The training of highly qualified personnel – investment in the training of professional personnel for the highest levels of the company's management is becoming ever more frequent. Competitiveness requires the increasing specialization of professionals to create and manage strategic projects;
- Contracts with professionals of the lower circuit of the urban economy (laborers and truck owner-drivers) – a situation which will continue for a long time yet among logistic operators, despite the advances in technology and information. The demand in the sector of circulation and transport varies with space and time, depending directly on the direction taken by the economies of specific localities;
- Territorial logistics: the siting of the infrastructural assets so as to diminish distances and thus facilitate the company's operations;
- Partnerships and operational agreements with companies managing flows of merchandise and corporations: operational agreements are, for logistic operators, much like market control, when there is the occasional need to

transport a greater volume of goods than is normally considered;

- Strategies (competitive advantages): are the factors which differentiate logistic operators within a highly competitive field. One includes here what the logisticians call "level of service" offered, always differentiated and adequate to the needs of the shippers, which, in their turn, also draw up their own strategies and other competitive advantages;
- And, finally, normative knowledge *sensu stricto*: the logistic operator dominates in depth the norms of the circulation of goods, both in Brazil and in those other countries with which relations of circulation are established. The above elements are essential to make both exportation and importation viable.

The basic topology of an MFG may be described as follows: first a contract is established between a shipper and the company which will transport the merchandise. This contract is issued as a Multimodal Bill of Lading, an instrument which foresees the transport of merchandise from its origin to its destination. As regards distribution centers or warehouses, there is the picking up of goods by means of trucks which will transport the products to terminals (intermodal, ports, airports etc.). At that point there may or may not occur the transfer of goods, but there will be the transfer to another mode of transport which, in its turn, will transport the merchandise to another terminal to complete the operation, usually by means of trucks. This is the basic scheme principally as regards the industrialized merchandise which will be consumed in cities. In dealing, for example, with agricultural products, minerals, we have other topologies with more frequent use of pipelines, ships and railroads as the final links in the process of circulation.

Final considerations

The complexity of the movement of merchandise on the part of the MFGs does not necessarily reduce costs, but it does aggregate value to corporate mobility. With the possibilities that technological progress has made available to us, logistics has ceased to focus exclusively on the reduction of costs to become "competitive strategy" by means of the constant increase in speed of the operations directed to the reproduction of capital and realize

the value invested, as well as satisfying the consumers (on almost all social levels) ever more avid for rapid delivery. These factors together with the idea of rationality and the ideology of competitiveness (in which speed and punctuality are factors which define production) raise the status of the transport of goods in the spatial circuits of production and their circles of spatial cooperation.

Value chains are strategic, despite logistics' relating principally to the idea of importation/exportation and of infrastructure (ports, railroads, highways etc.) for the "outflow of production", it does not operate only from a warehouse to the port and vice-versa, but links value-chains with each other, thus defining spatialities. This is the correct approach to the understanding of territorial logistics, in view of the need to coordinate the intensity of the flows of goods in the cities and the road transport as an integral part of multimodal logistics, within the perspective of the control of the territory and the times of displacement, especially in terms of its reduction. The use of multimodality by corporations also reveals the strengthening of the norms as instruments for the organization of hegemonic circulation.

Logistics is a branch of economic activity which has a clear strategic function for corporations, that of 'taming' spatial and temporal adversities (Sorre 1948; Ratzel 1987) in their own favor. Logistics thus makes its appearance in the process of the extraction of surplus value on the part of corporations. Large-scale industry is, then, no longer the only organizer of the flows; the nodes chosen for the organization of territorial logistics are not exclusively the great cities, they are now also the intermediate ones; with the principal, which is the creation of complex logistic networks based on operational agreements and cooperation between the various agents related to the movement of goods, determining the rational and corporative use of the territory.

The interrelationships of norms, both those related to techniques and to institutions, have expanded to global scale. This is illustrated by the creation of the figure of the MTO. In Brazil, this mechanism was created to give greater fluidity to the flows of merchandise. However, the MTO is still not operating to its full potential. The regulation of the MTO follows in the wake of the events of the present logistics-telematics circulation paradigm.

The fact that it is a recent instrument has led to its coming into conflict with historical infrastructural problems such as taxes and other hurdles, whence arose some problems relating to its practical operation, and some contradictions. In many cases, the interests of the agents of circulation and of production came into conflict with the wider interests of the State, lacking in articulation in its various areas of activity. Despite the existence of the problem, the companies do in fact practice intermodality, another specific aspect of the logistics-telematics period. The difference lies in the technical and normative coordination, an example of which is provided by container transport.

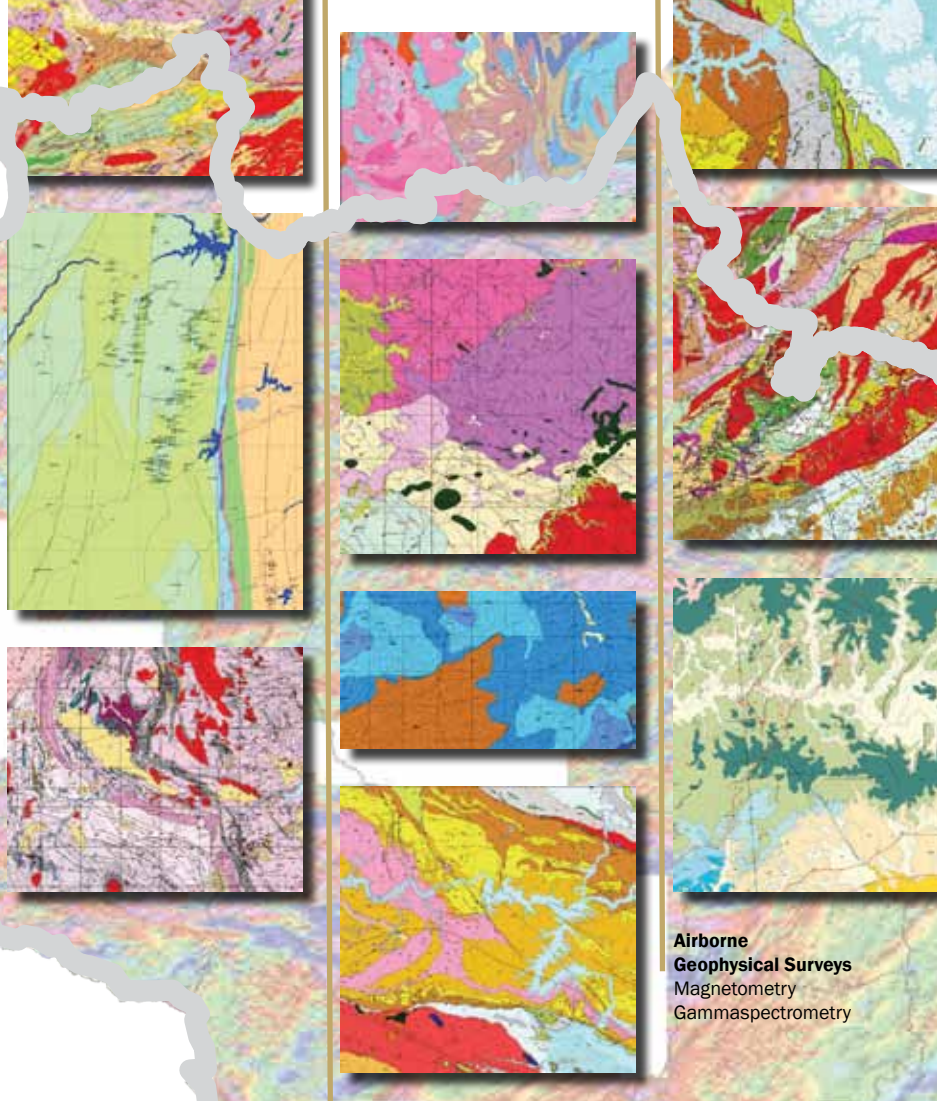
These are, then, some of the considerations which will continue to be investigated and analyzed, together with the development of the techniques and the elaboration of norms which may modify the modes of circulation in view of the dynamism of circulation as an instance of geographical space.

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